Environmental
COMMUNITY LETTER

February 2004

Lawrence Livermore National Laboratory
P.O. Box 808, L-626, Livermore, California 94551

The Laboratory recently published its *Environmental Report 2002*. The report assesses the impact of Laboratory operations on the environment for the year 2002. It summarizes Laboratory regulatory compliance activities and reports results of environmental monitoring.

The report represents the collection and analysis of several thousand environmental monitoring samples. These samples are taken from the air, water, and wastewater discharged from site. Samples are also taken from vegetation, foods, and soil on site and in surrounding communities. Many different assessments are made from these samples. For example, some groundwater samples may be assessed for 50 different chemicals or characteristics.

Specific Monitoring Activities

Air Monitoring

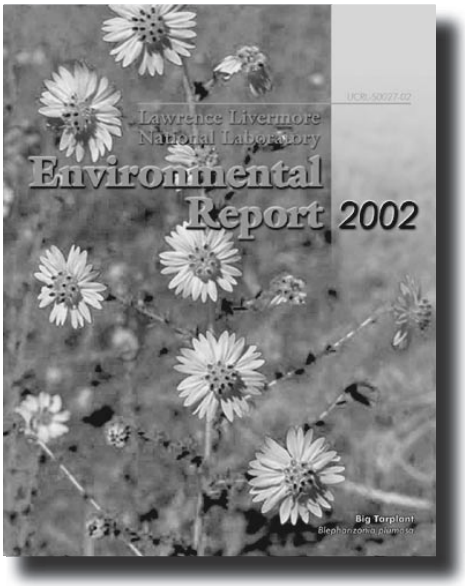
Air is monitored for radionuclides at various locations on the Livermore site and Site 300, throughout the Livermore Valley, and in the Tracy area. Concentrations of all monitored radionuclides and beryllium at all locations were well below levels that would endanger the environment or public health. For example, the highest median concentration of plutonium for all sampling locations at both the Livermore site and Site 300 was 0.03% of the federal standard.

Emissions of nonradioactive hazardous and toxic air pollutants from Laboratory operations in 2002 were also low. For example, total nitrogen oxide emission from the Livermore site was approximately 67 kilograms per day. This is about 0.08% of the amount released daily from all sources in the Bay Area.

Approximately 109 kilograms per day of permitted air pollutants (including nitrogen oxides, volatile organics, sulfur oxides, particulate matter, carbon monoxide, and lead) are emitted from the Livermore site. About 2.5 kilograms per day are emitted from Site 300. These releases from the LLNL sites are less than 0.1% of the total daily emissions in the entire Bay Area.

continued on page 2

ENVIRONMENTAL REPORT 2002 OVERVIEW



Environmental monitoring of LLNL operations shows no adverse impact to public health or the environment.

Overall, environmental evaluations generally show continuing low contaminant levels. This demonstrates the Laboratory's increased control of potential contaminants from current operations. For example, radiological doses to the most exposed member of the public caused by LLNL operations are less than 0.25% of regulatory standards. This is about 13,000 times smaller than the dose from radiation naturally and normally present in the environment.

Wastewater Monitoring

The Livermore site discharges over 900,000 liters of wastewater daily to the City of Livermore sanitary sewer system. This is about 4.0% of the total flow to the system.

Sewage flow from LLNL to the Livermore Water Reclamation Plant (LWRP) is monitored continuously. If any significant releases of radioactivity, metals, or high or low pH water are detected, the wastewater is redirected to an LLNL sewer diversion system before it leaves the LLNL site. It is then treated and disposed of appropriately.

Drinking Water Monitoring

In 2002, the maximum tritium activity measured in off-site drinking water was less than 1% of the regulatory maximum contaminant level (MCL). Gross alpha and gross beta radioactivity measurements were also well below regulatory levels of concern.

Groundwater Monitoring

In the Livermore Valley, no monitored radioactive or inorganic nonradioactive constituent was found to exceed primary drinking water MCLs in any off-site well. Nitrates have been detected above the primary MCL in on-site wells.

Shallow groundwater in certain areas beneath Site 300 contains volatile organic compounds (VOCs), tritium, nitrate, Freon, perchlorate, and depleted uranium. These present no current health risks because the shallow groundwater is not used as a source of water supply.

Soil and Sediment Monitoring

In 2002, as in past years, most analyses of on-site soil samples did not detect any nonradiological contaminants labeled as potential "constituents of concern." A few analyses detected either trace amounts of contaminants or naturally occurring background concentrations. Radiological results were unchanged from very low levels of previous years. Elevated concentrations of depleted uranium continue to be found at locations within Site 300. Findings are within the ranges seen in the past.

All soil samples taken in the City of Livermore's Big Trees Park found plutonium well below levels of regulatory concern. A May 2002 report by LLNL confirmed there was no threat to human health. The document presents a thorough statistical evaluation of the sampling data.

The federal Agency for Toxic Substances and Disease Registry (ATSDR) found that the most credible source of the plutonium in the park was sewage sludge applied when planting ornamental trees several decades ago.

LLNL released plutonium at lower than permitted levels to the Livermore sanitary sewer in the 1960s. The plutonium was found in sludge made available to the public. No health risk from the low levels of plutonium in the sludge was found at that time. Since that time, state and federal regulatory agencies have confirmed that finding after many detailed, public investigations. All regulatory agency findings are available to the public.

Off-site Vegetation and Foodstuff Monitoring

In general, off-site monitoring for tritium in vegetation and foodstuffs showed low values not significantly different from those for the past few years.

As usual, there was slightly more tritium near the Livermore site than was found at more distant locations. Potential ingestion dose estimates were well below regulatory levels of concern, even when organically bound tritium was taken into account.

Groundwater Remediation

Groundwater treatment facilities at the LLNL Livermore site have processed over 7.4 billion liters of groundwater (more than 2 billion gallons) since 1989. Over 1380 kilograms of VOCs were removed during treatment in that period.

Since treatment began at Site 300, about 865 million liters (more than 230 million gallons)

of groundwater have been treated. About 231 kilograms of VOCs have been removed from soil and groundwater.

Waste Minimization and Pollution Prevention

Waste generation at LLNL generally continues to decrease. There were reductions over the past year in radioactive and mixed waste, as well as routine nonhazardous waste. One-time nonhazardous waste and hazardous waste increased slightly.

Total LLNL routine nonhazardous waste diverted from landfills in 2002 was more than 4000 metric tons. That means the Laboratory diverted 69% of its routine nonhazardous waste. Total routine and nonroutine waste diverted was 18,649 metric tons. This includes 1.5 tons of toner cartridges, 302.7 tons of paper and 21.6 tons of batteries.

Radiological Dose Assessment

Every year a theoretical radiological dose from the Laboratory to the public is calculated. The dose is based upon what an individual would receive if he/she lived for a year where the highest radiation dose from releases to the air would occur. For the Livermore site that dose was 0.023 millirem in 2002. For Site 300 it was 0.021 millirem. These doses are very small compared with an average annual radioactive dose of 360 millirem received from radiation present normally and naturally in the environment. Federal radioactivity exposure standards limit the annual dose an individual can receive to 10 millirem. LLNL has never exceeded these federal standards.

Regulatory Compliance

LLNL must meet federal, state, regional, county, and local environmental requirements. For example, in 2002, the Bay Area Air Quality Management District issued or renewed about 200 operating permits for the Livermore site. The San Joaquin Valley Unified Air Pollution Control District issued or renewed permits for 44 air emissions sources at Site 300.

LLNL also has permits for medical waste, hazardous waste treatment and storage, underground and aboveground storage tanks, and for discharge of treated groundwater, industrial and sanitary sewage, and storm water. Site 300 has additional permits for inactive landfills, cooling tower discharges, operation of the sewer lagoon, septic tanks, and leach fields. The Laboratory complies with all requirements for self-monitoring, and inspections are conducted by the regulatory agencies issuing these permits.

Federal and regulatory agencies conduct inspections at both Livermore and Site 300. There were three violations noted during inspections in 2002. None of these violations caused impact to human health or to the environment.

Endangered Species

The Laboratory meets the requirements of the U.S. Endangered Species Act and the California Endangered Species Act. In 2002, monitoring for the California red-legged frog continued at the Livermore site. Biological surveys were conducted for proposed Laboratory projects at Site 300 that had the potential to disturb special-status species. No San Joaquin kit fox has been seen at Site 300 but American badgers were found. Also, active western burrowing owl dens were identified. A population of California tiger salamander continues to be monitored, as do three rare plant populations.

Contract Performance Measures

The University of California's contract with the U.S. Department of Energy to operate the Laboratory includes performance measures related to environmental protection. At the end of 2002, the Laboratory received an average score of excellent for its environmental management.

WHAT IS AN ANNUAL ENVIRONMENTAL REPORT?

Each year LLNL is required to prepare hundreds of different reports for the agencies in charge of regulating the Laboratory. Among the agencies protecting public health and the environment are the U.S. Environmental Protection Agency, regional air and water boards, and the California Department of Toxic Substances Control.

These agencies, as well as the U.S. Department of Energy (DOE), National Nuclear Security Administration, and the University of California, oversee Laboratory operations and monitor any impacts that LLNL operations may have on the public or the environment.

Environmental monitoring data collected and the related modeling, analysis, and conclusions are presented to regulatory agencies and are available to the public. It takes about a year to collect this data and conduct analyses to produce an Environmental Report.

The 2002 document is published in two parts. The first part contains the summary and analyses of the collected data. The second is the data used to produce the summary and analyses. Together the two documents total about 500 pages.

You will find the *Environmental Report 2002* in the LLNL Environmental Repositories at the Livermore and Tracy libraries and at the LLNL Discovery Center. The documents are also available on the Web at: http://www-envirinfo.llnl.gov/ under Site Annual Environmental Report.

Please call me at (925) 424-4026 or email heffner1@llnl.gov with questions at any time.

H. F. Heffner, Manager, Environmental Community Relations, Environmental Protection Department

Lawrence Livermore National Laboratory is one of our nation's premiere scientific institutions. It is a federal facility, owned by the National Nuclear Security Administration of the U.S. Department of Energy.

The University of California has managed and operated the Laboratory under contract to the U.S. Department of Energy for over 50 years. The Laboratory has over 8000 employees and received $1.6 billion last year for its activities and facilities.

The Laboratory mission focuses primarily on the safety and security of the nation's nuclear weapons stockpile. It also works to prevent the spread and use of weapons of mass destruction and to increase homeland security. Research is also conducted in such areas as energy, the environment, and biomedicine.

All Laboratory operations are conducted in compliance with local, state, and federal environmental regulatory requirements. This is done with the support of the Environmental Protection Department (EPD).

The EPD is responsible for environmental monitoring and analysis, radioactive and hazardous waste management, and environmental restoration. It also works with other Laboratory organizations to ensure compliance with environment laws and regulations.

The Laboratory has two sites. The Livermore site is southeast of the City of Livermore. Site 300, an experimental testing facility, is about 8 miles southwest of Tracy in the Altamont Hills.

This work was performed under the auspices of the U.S. Department of Energy by University of California Lawrence Livermore National Laboratory under Contract W-7405-ENG-48. UCRL-AR-112812-04-1